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The History of Scoliosis.

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THE HISTORY OF SCOLIOSIS.*

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To write the history of scoliosis one must start with the beginnings of medicine and follow down through some 2500 years the course of an affection for many centuries classed with other curvatures of the spine, and considered, as they were considered, due to dislocation of the vertebræ. One finds in this, as in most affections long recognized, that time brings about its identification as an entity, and it gradually becomes separated from similar affections and is discussed by itself.

Now the presentation of the information thus obtained may be made in two ways. First, one may present a systematic and thorough account of the status at different periods in medical history, and show how one step led to another in the evolution of our knowledge. But in the case of scoliosis this method is not perhaps the best, because it has already been admirably and thoroughly done by Fischer† and Chlumsky,‡ and because of the enormous mass of literature which has accumulated. Prior to 1870 Fischer had tabulated 380 articles, and in the résumé of modern orthopedic literature published by Hoffa and Blencke in 1905 there were 1020 titles given dealing with scoliosis. Hundreds of articles have appeared since 1905, and it is evident that the mass of literature is enormous.

The second method of presentation of such a subject would consist of a brief résumé of its evolution, with emphasis on what seemed to be the salient points, the real steps in progress, points which have improved our knowledge of etiology or the

* Read by title before the American Orthopedic Association, May, 1913.

† Geschichte und Behandlung der seitlichen Rückgratsverkrümmung. Strassburg, 1885.

‡ Chlumsky. Prispěvky k Dějinám Skoliosy. Prag, 1910.

efficiency of our treatment. And so the second has been chosen as the most available for the present purpose.

One finds in the study of the origin of most pathological conditions that they are at first confused with other similar affections, gradually emerging and being identified, and in scoliosis this is particularly the case, all curvatures of the spine—forward, backward and sideways indiscriminately—being considered practically up to the eighteenth century as dislocations.

The term “scoliosis” dates much farther back than the recognition of the affection itself. *σκολίω*, from which scoliosis is derived, is a Homeric word meaning to bend or twist, and the term *σκολίωσις* was first used by Hippocrates, who lived four centuries before the beginning of the Christian era. His use of the word apparently was to designate a lateral form of the spinal curve supposed to be due to dislocation, the forward curve being called lordosis and the backward curve kyphosis. There were two other words in use at this time which have dropped out, and which are of no significance.

Although the name scoliosis was given by Hippocrates, a very short extract from his works will show that he had little or no idea of what the condition was. After a description of posterior curvature of the spine, which is fairly accurate in a very rough way, he goes on—“In some cases the curvature of the spine is lateral, that is to say, either to the one side or to the other, and most of such cases are connected with tubercles (abscesses?) within the spine, and in some the position in which they had been accustomed to lie cooperates with the diseasebut these will be treated of among the common affections of the lungs.”

“Lateral curvatures also occur, the approximate cause of which is the attitudes in which these people lie. These cases have the prognostics accordingly.”

Yet Hippocrates gave a very clear description of club-foot, which was well recognized by him, and although the splints advised seem rather inefficient the treatment by moulding and retention was advocated. Patients with spinal curveos, however, were tied by the legs to a ladder, and the ladder raised

and then dropped to the ground, striking on one end, thus tending to straighten the spine, or such patients were put into an apparatus to make extension and pressure on the prominence. He adds as a further refinement of his treatment, "It is also safe for a person to sit upon the hump while extension is being made, and raising himself to let himself fall down again upon the patient." He also suggests putting one foot on the hump or using a long wooden lever, but one finds no mention of any attempt at retention, and the reason for this is that all the treatment was based on the supposition that the affection was due to a dislocation, which demanded reduction only.

For about two thousand years after Hippocrates scoliosis attracted little attention and no advance was made, Paul of Aegina, 650 A. D., suggested bandaging to wooden strips in cases of curvature of all varieties, and Albukasis 500 years later announced that "no one could cure curvature to the side."

And so one comes down through the centuries with no new light to the time of Ambroise Paré, born in 1510, and we find him where we left Hippocrates 2000 years before. I quote from his writings: "A dislocated vertebra standing forth and making a bunch is termed in Greek kyphosis, but when it is depressed it is called lordosis, but when the same is luxated to the right or left side it maketh a scoliosis, which, wresting the spine, draws it into the similitude of the letter S Fluid and soft bodies, such as children, are very subject to generate this internal cause of defluxion. Thus nurses, while they too straitly lace the breasts and sides of girls so to make them slender, cause the breast bone to cast itself in forward or back or else the one shoulder to be bigger or fuller, the other more spare or lean. The same error is committed if they lay children frequently and long upon their sides, then upon their backs, or if in taking them up when they walk they take them only by the feet or legs and never put their other hand in their backs, never so much as thinking that children grow most toward their heads." Then follows a fair account of the deformity, and the reduction of the dislocation is on the same lines as advocated by Hippocrates, by extension and pressure by the

hand or by lever. He suggested, however, the use of a padded iron corset, the illustrations of which are familiar to all of you, but still it was always a dislocation that was considered. It was to be treated by levers and great force, and the after-treatment played only a very small part.

Among the various authors of the next hundred years one finds silence on the subject in most, such as Fabricius, Hieronymus and Vesalius, but here and there are flashes of light, mostly fantastic speculations as to etiology, but the affection was frequent, for Riolan in 1641, stated that in France the girls carried as a rule the left shoulder higher than the right, and that one could hardly find a case where the shoulders were rightly constructed. His speculations as to etiology were much the same as those of the nineteenth century, namely, the use of the right arm and the wearing of stiffened corsets. The first autopsy of a scoliotic case was reported in 1646 by Fabricius Hildanus, without apparently clearing up the matter. Glisson, writing of rickets, which he named rachitis, in 1660, described the spinal curves due to it, and suggested for their indiscriminate treatment gymnastics or suspension, but Glisson's suspension was from axillæ, head and hands, by which the children were slung and allowed to play in the air, which he adds "they did with great enjoyment." The head sling proper dates from Nuckius in 1696, and was devised for the treatment of wry neck.

From this time until the time of André in 1741, I cannot see that any author contributed much to progress, although it is evident that whalebone corsets were coming into use as a method of treatment, originating with Jungken in 1691, and the mention of scoliosis is more frequent than in the preceding century, but never apparently differentiated clearly from other curvatures.

André was a man of originality, the inventor of the term "orthopedic," and he wrote more fully of spinal curves than his predecessors. He condemned high heels and blamed them and bad sitting positions for much of the faulty attitude. Among causes for spinal curves he mentioned hemorrhoids, which were so painful that the child could not sit squarely, and

he called attention to the important fact that as a child grew the clothes must be made larger. He suggested gymnastics and apparatus as a means of treatment.

Taking it altogether the middle of the eighteenth century, that is to say, the time of the beginning of the American Revolution, was a time of considerable activity and some little progress in the history of scoliosis. André was the first to group deformities together and to give a name to the specialty. His directions about treatment were vague, but he recognized in bowlegs at least that the same means must be taken to straighten them as were adopted to straighten the crooked stem of a young tree. He advocated friction of the deformed parts and their gradual restoration by manual extension, pressure and localized movement. A very distinct step at about this time was made by the classical work of Percival Pott, who published in 1779, his essay on "The Palsy of the Lower Limbs in Consequence of a Curvature of the Spine." In this work he took out of the unclassified group of affections known as curvatures of the spine those posterior curves caused by spinal tuberculosis. He stated with regard to the paralysis "that none of those strange twists and deviations which the majority of European women get in their shapes from the very absurd custom of dressing them in stays during their infancy, and which put them into all directions but the right, ever caused anything of this kind, however great the deformity might be." His description of spinal tuberculosis was so accurate that it immediately identified posterior curvature as a carious or scrofulous disease of bone and not as a dislocation, and thus cleared the field for the recognition of scoliosis as an entity.

About this time scoliosis was becoming more clearly defined. Autopsies were being performed, and it was being recognized that it was not to be classed and treated with the posterior curvatures. This came not only from the work of Pott, but was gradually coming in from all sides, and apparatus of various kinds began to be devised. The iron cross of Heister, invented in 1700, began to be displaced by apparatus more of the modern type, and the corset of Maguy, devised in 1762, would

find a sale to-day in the instrument shops, but the greatest impetus was given by the apparatus of Levacher in 1768, which consisted of a whalebone corset to which was affixed a jury mast and a head sling.

Although the period at the middle of the eighteenth century, as has been said, was one of considerable activity and progress, in the development of scoliosis, at about this time there began and lasted for over a hundred years, the dreariest and most confusing period in the history of the affection. The theorist and the apparatus inventor went mad, and every form of device appeared. Braces and corsets infinitely complicated, worse than useless, appeared by the dozen. Beds especially constructed, chairs, slings, swathes, belts, levers and the like, all found their advocates, and theories as to the causation also ran riot, but on the whole the invention and elaboration of apparatus held the center of the stage, and one heard but little of gymnastics.

It is difficult to trace the origin of the gymnastic treatment of scoliosis, for it had existed from an early time. Even as early as Glisson a system of gymnastics was clearly formulated, and apparently gymnastic treatment was not at that time by any means new. Sydenham, 1624-1689, wrote "If any one knew of the values of friction and exercise and could keep his knowledge secret he might easily make a fortune," and "Fuller's *Medicina Gymnastics*," published in 1704, was followed by a similar work by Tissot in 1781, and by Jahn and others, who worked with energy to spread German gymnastics. A very decided impetus came from Sweden from Henry Ling, who died in 1839, and who founded a system of gymnastics known as the Ling system or Swedish movement treatment. An institute under the supervision of the Swedish government was established in Stockholm, and Ling was its first president. A paper advocating gymnastic treatment was published by Langgard in 1868, and books and monographs followed in rapid succession.

Thus toward the middle of the nineteenth century, at the close of the hundred-year period I have spoken of as dreary and demoralizing, gymnastic treatment began to crowd apparatus

treatment and to absorb some of the attention previously given wholly to mechanical treatment. From this point gymnastic treatment has increased in prominence until it is fair to say that to-day it constitutes the bulk of the scoliosis treatment in America. Personally I believe that this is wrong, and that gymnastics are not suited to the treatment of moderate and severe structural scoliosis. I merely mention this as a qualification of the statement made above, and in explanation of my analysis of the progress of orthopedic surgery from this point.

Shortly after the middle of the nineteenth century there began what seems to me to be the first real progress that had been made in the treatment of scoliosis. To one who reads the history of the past the impression is left that up to this time the etiology had been the subject of a great deal of loose and irrational theory, that the recognition and identification of the affection had been delayed for centuries, and that all treatment up to this time had been, as we see it to-day, ineffectual and comparatively useless.

In 1878, Lewis A. Sayre published a book on "Spinal Disease and Spinal Curvature," in which he advocated their treatment by self-suspension and a plaster-of-Paris jacket. Self-suspension he credited to Dr. Benjamin Lee of Philadelphia and Prof. Mitchell of Philadelphia. He advocated the application of a plaster-of-Paris jacket in suspension, with the heels lifted from the ground, and he claimed for them nothing more than support in an improved position. The jackets were removable, and exercises were done daily. The treatment was too mild to be effective, but it contained apparently the germ of the modern progress in the treatment of the affection. The use of plaster-of-Paris jackets thus became more or less common in cases of Pott's disease as well as of scoliosis, and the work of Calot in 1896, who advocated at that time the use of forcible correction in the treatment of Pott's disease, suggested the use of more force than had been previously used in the correction of lateral curvature. Schanz published in 1900, an account of an efficient technic for the application of jackets in suspension, and reported results in 1902. In 1901, I reported results and described the

technic where the patient lay on the face during the application, and there were other papers written at about this time, but the great impetus to the treatment by forcible correction came from Wullstein, who read a paper at the International Congress in Paris in 1900, and who published his experiments, methods and results in 1902. He showed experimentally that bony scoliosis could be produced in young dogs who were kept for some months in a bandage, inducing a lateral curve of the spine, and by the use of plaster-of-Paris jackets applied to the scoliotic patient in an improved position, induced by the use of great traction and lateral pressure, he secured results that were better than any previously reported. The work attracted much attention, and markedly modified the whole point of view with regard to forcible correction, which began to gather a body of adherents whose number has steadily increased.

The method of Wullstein has been extensively modified. Jackets have been applied with the patient on the face, on the side, on the back, with the spine flexed, with the spine hyperextended, on simple hammocks, and in complicated apparatus, but the principle demonstrated as effective by Wullstein and carefully elaborated by him has not been modified, namely, crowding the spine into an improved position and holding it there during as long a period as seems practicable, and for this purpose using plaster of Paris.

There have been from time to time pieces of work elaborated which have modified our point of view with regard to the etiology of scoliosis, and have to a certain extent influenced our treatment. The work of Böhm in 1906, called our attention to the frequency of congenital malformations as a cause of scoliosis, and immediately transferred many cases from the class of acquired scoliosis, to the class of congenital scoliosis. Subsequent work by Böhm and by others has laid stress on the fact that the occurrence of severe scoliosis is probably due to congenital conditions or to abnormalities of bone, and that too much importance must not be allowed to the former ideas that severe scoliosis was caused by assumed bad posture, carrying burdens, bad school positions, etc.

The discussion in the German Orthopedic Congress in 1910, with regard to school life as a cause of severe scoliosis was most illuminating, and the majority of the writers who participated were of the opinion that although the school might cause a postural scoliosis it was very doubtful if it could be accepted as a routine cause of severe scoliosis.

The monumental work of Schultess in the Joachimsthal Handbuch für Orthopädische Chirurgie formulated, clarified and illustrated our knowledge of scoliosis.

In making this analysis I have tried at intervals to formulate to myself what was the treatment of scoliosis at any given time. I wished particularly to present the treatment of scoliosis as it existed in the middle of the last century, but I found that where I did not speak from personal knowledge I must be dependent upon one or another author, and that these differed so widely in their point of view that I could not present an intelligent short résumé, and with regard to the treatment of scoliosis to-day I find myself, where I do speak from personal opinion, in much the same position. What the prevailing treatment of scoliosis is to-day cannot be stated in a few sentences. Some men advocate one method, some another. To those of us who believe that forcible correction has accomplished more than any other treatment and will accomplish more in the future, the development of the real treatment of scoliosis dates from 1875. To those who believe that the gymnastic treatment of scoliosis is the best, and that forcible correction is wrong, the progress in the matter of scoliosis starts with Hippocrates and comes down in a wavering and discouraging line from that date until the present, with a better knowledge of the affection on the whole, with probably some more effective gymnastic technic, but without any very great advance within the last hundred years in the line of efficiency.

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